of the detected worst bit error rates and searching a discrimination threshold of the received signal according to the predetermined bit error rate.

2. The method of claim 1 wherein the predetermined bit error rate comprises the lowest bit error rate assumed from the plurality of the detected worst bit error rates.

3. A method to determine a discrimination threshold of a received signal input from an optical transmission line, comprising:

a first searching step to measure a bit error rate of the received signal at an initial discrimination threshold by changing a polarization direction of an optical signal which enters the optical transmission line and to search a polarization state of the optical signal which makes the bit error rate the worst; and

a second searching step to scan the discrimination threshold of the received signal keeping the polarization state of the optical signal after the first searching step to search a discrimination threshold of the received signal which becomes a predetermined bit error rate.

4. The method of claim 3 wherein the predetermined bit error rate comprises the lowest bit error rate.

5. An apparatus to determine a discrimination threshold of a received signal from an optical transmission line, comprising:

a polarization controller disposed between an optical transmitter for outputting an optical signal and the optical transmission line to rotate polarization of the optical signal output from the optical transmitter;

a photodetector to convert the optical signal propagated on

the optical transmission line into an electric signal;

a discrimination circuit to discriminate the output from the photodetector according to a discrimination threshold;

an error rate measuring circuit to measure a bit error rate of the output from the discrimination circuit; and

a control circuit which controls the polarization rotating amount of the polarization controller and the discrimination threshold of the discrimination circuit to search the worst bit error rate at each discrimination threshold by changing the polarization rotating amount of the polarization controller at each of a plurality of discrimination thresholds and to search a discrimination threshold having a predetermined bit error rate out of the worst bit error rates.

6. The apparatus of claim 5 wherein the control circuit sets the discrimination circuit for a finally obtained discrimination threshold.

7. The apparatus of claim 5 wherein the predetermined bit error rate comprises the lowest bit error rate assumed from the plurality of the worst bit error rates.

8. An apparatus to determine a discrimination threshold of a received signal input from an optical transmission line comprising:

a polarization controller disposed between an optical transmitter for outputting an optical signal and the optical transmission line to rotate polarization of the optical signal output from the optical transmitter;

a photodetector to convert the optical signal propagated on the optical transmission line into an electric signal;

a discrimination circuit to discriminate the output from the photodetector according to a discrimination threshold;

an error rate measuring circuit to measure a bit error rate of the output from the discrimination circuit; and

a control circuit which controls the polarization rotating amount of the polarization controller and the discrimination threshold of the discrimination circuit to search a polarization rotating amount having the worst bit error rate by changing the polarization rotating amount of the polarization controller at an initial discrimination threshold, and to scan the discrimination threshold of the discrimination circuit keeping the polarization rotating amount to search a discrimination threshold having a predetermined bit error rate.

9. The apparatus of claim 8 wherein the control circuit sets the discrimination circuit for the finally obtained discrimination threshold.

10. The apparatus of claim 8 wherein the predetermined bit error rate comprises the lowest bit error rate.

11. An optical transmission system comprising:

an optical transmission line;

an optical transmitter to output an optical signal;

a polarization controller disposed between the optical transmitter and the optical transmission line to rotate polarization of the optical signal output from the optical transmitter;

a photodetector to convert the optical signal propagated on the optical transmission line into an electric signal;

a discrimination circuit to discriminate the output from the photodetector according to a discrimination threshold;

an error rate measuring circuit to measure a bit error rate of the output from the discrimination circuit; and

a control circuit which controls the polarization rotating

amount of the polarization controller and the discrimination threshold of the discrimination circuit to search a discrimination threshold corresponding to a predetermined bit error rate out of the worst bit error rates relative to the variation of the polarization direction of the optical signal.

12. The optical transmission system of claim 11 wherein the predetermined bit error rate comprises the lowest bit error rate within the worst bit error rates relative to the variation of the polarization direction of the optical signal.

13. The optical transmission system of claim 11 wherein the control circuit searches the worst bit error rate at each discrimination threshold by changing the polarization rotating amount of the polarization controller at each of a plurality of discrimination thresholds and searches a discrimination threshold to make the bit error rate the lowest out of the plurality of the worst bit error rates.

14. The optical transmission system of claim 11 wherein the control circuit searches a polarization rotating amount having the worst bit error rate by changing the polarization rotating amount of the polarization controller at an initial discrimination threshold, and scans the discrimination thresholds of the discrimination circuit keeping the polarization rotating amount to search a discrimination threshold making the bit error rate of the optical signal the worst.

15. The optical transmission system of claim 11 wherein the control circuit sets the discrimination circuit for the predetermined discrimination threshold.

---

16. (New) A method to determine a discrimination threshold of

A1 Cont.

a received signal from an optical transmission line, the method comprising:

measuring a bit error rate of the received signal at each of a plurality of discrimination thresholds by changing a polarization direction of an optical signal to enter the optical transmission line to detect a worst bit error rate at each of the discrimination thresholds; and

selecting one of the bit error rates from the detected worst bit error rates and determining a discrimination threshold of the received signal according to the selected bit error rate.

17. (New) The method of claim 16 wherein the selected bit error rate comprises a lowest bit error rate of the detected worst bit error rates.

18. (New) A method to determine a discrimination threshold of a received signal from an optical transmission line, the method comprising:

measuring a bit error rate of the received signal at an initial discrimination threshold by changing a polarization direction of an optical signal which enters the optical transmission line;

determining highest error polarization state of the optical signal which makes the bit error rate the worst;

determining a discrimination threshold of the received signal at the highest error polarization state of the optical signal; and

determining a bit error rate of the threshold, which corresponds to the discrimination threshold of the received signal at the highest error polarization state.

19. (New) The method of claim 18 wherein bit error rate of the threshold, which corresponds to the discrimination threshold of the

received signal at the highest error polarization state, comprises the lowest bit error rate.

20. (New) An apparatus to determine a discrimination threshold of a signal received from an optical transmission line, the apparatus comprising:

a polarization controller, by which optical polarization is changed, disposed between an optical transmitter that provides the signal to an optical transmission line and the optical transmission line;

a photodetector that converts the optical signal, received from the optical transmission line, into an electric signal;

a discrimination circuit which discriminates an output from the photodetector with reference to a discrimination threshold to produce a discriminated signal;

an error rate measuring circuit that measures a bit error rate of the discriminated signal; and

a control circuit which controls the polarization of the polarization controller and the discrimination threshold of the discrimination circuit to determine a worst bit error rate at each of a plurality of discrimination thresholds by changing the polarization of the polarization controller at each of the discrimination thresholds and to determine a discrimination threshold from a bit error rate selected from the worst bit error rates.

21. (New) The apparatus of claim 20 wherein the control circuit sets the discrimination circuit for the determined discrimination threshold.

22. (New) The apparatus of claim 20 wherein the predetermined bit error rate comprises a lowest bit error rate of the worst bit error rates.

23. (New) An apparatus to determine a discrimination threshold of a received signal input from an optical transmission line comprising:

a polarization controller disposed between an optical transmitter and an optical transmission line, to rotate polarization of an optical signal output from the optical transmitter;

a photodetector to convert the optical signal propagated on the optical transmission line into an electric signal;

a discrimination circuit to discriminate an output from the photodetector according to a discrimination threshold;

an error rate measuring circuit to measure a bit error rate of an output from the discrimination circuit; and

a control circuit which controls the polarization rotating amount of the polarization controller and the discrimination threshold of the discrimination circuit to search a polarization rotating amount having a worst bit error rate by changing the polarization rotating amount of the polarization controller at an initial discrimination threshold, and to scan the discrimination threshold of the discrimination circuit while keeping the same polarization to determine a discrimination threshold having a particular bit error rate.

24. (New) The apparatus of claim 23 wherein the control circuit sets the discrimination circuit for a default discrimination threshold.

25. (New) The apparatus of claim 23 wherein the predetermined bit error rate comprises the lowest bit error rate.

26. (New) An optical transmission system comprising:

an optical transmitter that provides an optical signal;

an optical transmission line that accepts the optical

signal;

a polarization controller disposed between the optical transmitter and the optical transmission line that rotates polarization of the optical signal provided by the optical transmitter;

a photodetector that converts an optical signal, accepted from the transmission line, into an electric signal;

a discrimination circuit that discriminates an output from the photodetector with respect to a discrimination threshold;

an error rate measuring circuit that measures a bit error rate of an output from the discrimination circuit; and

a control circuit which controls the polarization of the polarization controller and the discrimination threshold of the discrimination circuit to select a discrimination threshold corresponding to a particular bit error rate out of a plurality of worst bit error rates relative to variations of the polarization of the optical signal accepted from the transmission line.

27. (New) The optical transmission system of claim 26 wherein the particular bit error rate comprises the lowest bit error rate of the worst bit error rates of the measured polarizations of the optical signal.

28. (New) The optical transmission system of claim 26 wherein the control circuit selects the worst bit error rate at one of a plurality of discrimination threshold by changing the polarization of the polarization controller at each of the discrimination thresholds and determines a discrimination threshold to make the bit error rate the lowest out of the worst bit error rates.

29. (New) The optical transmission system of claim 26 wherein the control circuit searches for a polarization having the worst bit

error rate by changing the polarization of the polarization controller at an initial discrimination threshold, and scans the discrimination thresholds of the discrimination circuit keeping the polarization to determine a discrimination threshold making the bit error rate of the optical signal the worst.

30. (New) The optical transmission system of claim 26 wherein the control circuit sets the discrimination circuit for the predetermined discrimination threshold.

31. (New) The method of claim 4 wherein searching a predetermined error rate from the plurality of the detected worst bit error rates comprises:

detecting a worst bit error rate at a plurality of discrimination thresholds;

connecting the points representing the worst bit error rate at the plurality of discrimination thresholds to form two substantially straight intersecting lines; and

using a point representing the intersection of the two substantially straight intersecting lines as the predetermined error rate.

32. (New) The method of claim 3 wherein searching a predetermined error rate from the plurality of the detected worst bit error rates comprises:

holding the discrimination threshold constant;

changing the polarization to determine a worst polarization state resulting in the highest BER;

keeping the worst polarization state and changing the threshold to determine the worst bit error rate.

33. (New) The apparatus of claim 10 wherein the apparatus that

sets the predetermined bit error rate comprises:

means for detecting a worst bit error rate at a plurality of discrimination thresholds;

means for connecting the points representing the worst bit error rate at the plurality of discrimination thresholds to form two substantially straight intersecting lines; and

means for using a point representing the intersection of the two substantially straight intersecting lines as the predetermined error rate.

34. (New) The apparatus of claim 10 wherein the apparatus that sets the predetermined bit error rate comprises:

means for holding the discrimination threshold constant;

means for changing the polarization to determine a worst polarization state resulting in the highest BER;

means for keeping the worst polarization state and changing the threshold to determine the worst bit error rate.

35. (New) The method of claim 17 wherein searching a predetermined error rate from the plurality of the detected worst bit error rates comprises:

detecting a worst bit error rate at a plurality of discrimination thresholds;

connecting the points representing the worst bit error rate at the plurality of discrimination thresholds to form two substantially straight intersecting lines; and

using a point representing the intersection of the two substantially straight intersecting lines as the predetermined error rate.

36. (New) The method of claim 17 wherein searching a predetermined error rate from the plurality of the detected worst bit

error rates comprises:

holding the discrimination threshold constant;

changing the polarization to determine a worst polarization state resulting in the highest BER;

keeping the worst polarization state and changing the threshold to determine the worst bit error rate.

37. (New) The apparatus of claim 22 wherein the apparatus that sets the predetermined bit error rate comprises:

means for detecting a worst bit error rate at a plurality of discrimination thresholds;

means for connecting the points representing the worst bit error rate at the plurality of discrimination thresholds to form two substantially straight intersecting lines; and

means for using a point representing the intersection of the two substantially straight intersecting lines as the predetermined error rate.

38. (New) The apparatus of claim 22 wherein the apparatus that sets the predetermined bit error rate comprises:

means for holding the discrimination threshold constant;

means for changing the polarization to determine a worst polarization state resulting in the highest BER;

means for keeping the worst polarization state and changing the threshold to determine the worst bit error rate.

39. (New) The apparatus of claim 26 wherein the apparatus that sets the predetermined bit error rate comprises:

means for detecting a worst bit error rate at a plurality of discrimination thresholds;

means for connecting the points representing the worst bit error rate at the plurality of discrimination thresholds to form two